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DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

RIN 0648-XB048

Takes of Marine Mammals Incidental to Specified Activities; Marine Geophysical Survey in the Northwest Pacific Ocean, March through May, 2012

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of an incidental harassment authorization.

SUMMARY: In accordance with the Marine Mammal Protection Act (MMPA) regulation, we hereby give notification that we have issued an Incidental Harassment Authorization (Authorization) to Lamont-Doherty Earth Observatory (Observatory), a part of Columbia University, to take marine mammals, by harassment, incidental to conducting a marine geophysical (seismic) survey in the central Pacific Ocean, May through June, 2012.

DATES: Effective May 1, 2012, through June 11, 2012.

ADDRESSES: To obtain an electronic copy of the Authorization, write to P. Michael Payne, Chief, Permits and Conservation Division, Office of Protected Resources, National Marine Fisheries Service, 1315 East-West Highway, Silver Spring, MD 20910–3225 or download an electronic copy at:

<http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications>.

To obtain an electronic copy of (1) the application containing a list of the references within this document; and (2) the National Science Foundation's (Foundation)

Environmental Assessment (EA) under the National Environmental Policy Act of 1969 and Executive Order 12114; write to the previously mentioned address, telephone the contact listed here (see FOR FURTHER INFORMATION CONTACT), or download the file at: <http://www.nmfs.noaa.gov/pr/permits/incidental.htm#applications>.

The Service's Biological Opinion will be available online at:

<http://www.nmfs.noaa.gov/pr/consultation/opinions.htm>.

FOR FURTHER INFORMATION CONTACT: Jeannine Cody, Office of Protected Resources, NMFS, (301) 427-8401.

SUPPLEMENTARY INFORMATION:

Background

Section 101(a)(5)(D) of the Marine Mammal Protect Act of 1972, as amended (MMPA; 16 U.S.C. 1361 et seq.) directs the Secretary of Commerce to authorize, upon request, the incidental, but not intentional, taking of small numbers of marine mammals of a species or population stock, by United States citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if: (1) we make certain findings; (2) the taking is limited to harassment; and (3) we provide a notice of a proposed authorization to the public for review.

We shall grant authorization for the incidental taking of small numbers of marine mammals if we find that the taking will have a negligible impact on the species or stock(s), and will not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses (where relevant). The Authorization must set forth the permissible methods of taking, other means of effecting the least practicable adverse impact on the species or stock and its habitat, and requirements pertaining to the

mitigation, monitoring and reporting of such takings. We have defined "negligible impact" in 50 CFR 216.103 as "...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival."

Section 101(a)(5)(D) of the Marine Mammal Protection Act established an expedited process for U.S. citizens to apply for an authorization to incidentally take small numbers of marine mammals by harassment. Section 101(a)(5)(D) of the Marine Mammal Protection Act establishes a 45-day time limit for our review of an application followed by a 30-day public notice and comment period on any proposed authorization for the incidental harassment of small numbers of marine mammals. Within 45 days of the close of the public comment period, we must either issue or deny the authorization and must publish a notice in the Federal Register within 30 days of our determination to issue or deny the authorization.

Except with respect to certain activities not pertinent here, the Marine Mammal Protection Act defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

Summary of Request

On December 12, 2012, we received a complete application from the Observatory requesting that we issue an Authorization for the take, by Level B harassment only, of small numbers of marine mammals incidental to conducting a seismic survey in the central Pacific Ocean from May 1 through May 26, 2012. We determined the application complete and adequate on February 28, 2012 and released the application for public comment (see ADDRESSES) for consideration of issuing an Authorization to the Observatory.

The Observatory, with research funding from the Foundation, plans to conduct the seismic survey from May 1 through May 26, 2012 offshore the Line Islands in the central Pacific Ocean. They plan to use one source vessel, the R/V Marcus G. Langseth (Langseth), an airgun array, and a single hydrophone streamer to provide the data necessary to understand sedimentation patterns on the flanks of the Line Islands Ridge and to investigate how climate patterns have varied over time in the late Pleistocene period. In addition to the operations of the seismic airgun array and hydrophone streamer, the Observatory intends to operate a multibeam echosounder (echosounder), a sub-bottom profiler, and an acoustic Doppler current profiler continuously throughout the survey except while on station for marine coring activities.

Acoustic stimuli (i.e., increased underwater sound) generated during seismic operations, may have the potential to cause a short-term, behavioral disturbance for marine mammals in the survey area. This is the principal means of marine mammal taking associated with these activities. We expect these disturbances to be temporary and result in a temporary modification in behavior and/or low-level physiological effects

(Level B harassment only) of small numbers of certain species of marine mammals.

We do not expect that the movement of the Langseth, during the conduct of the seismic survey, has the potential to harass marine mammals because of the relatively slow operation speed of the vessel (4.6 knots (kts); 8.5 kilometers per hour (km/h); 5.3 miles per hour (mph)) during seismic acquisition.

We also do not expect that the operation of the echosounder, sub-bottom profiler and current profiler have the potential to harass marine mammals because they would already experience effects from the airgun array. Whether or not the airguns are operating simultaneously with the other sources, we expect the marine mammals to exhibit no more than short-term and inconsequential responses to the echosounder, sub-bottom profiler and current profiler given their characteristics (e.g., narrow, downward-directed beam)

We have outlined the purpose of the program in a previous notice for the proposed Authorization (77 FR 19242, March 30, 2012). The Observatory's proposed activities have not changed between the proposed IHA notice and this final notice announcing the issuance of the Authorization. Refer to the notice of the proposed IHA (77 FR 19242, March 30, 2012), the application, and Environmental Assessment for a more detailed description of the authorized action, including vessel and acoustic source specifications.

Description of the Specified Geographic Region

The Observatory will conduct the survey in the Exclusive Economic Zones of the Republic of Kiribati and the U.S. The study area will encompass an area in the Line Islands bounded by approximately 0.5 – 8 degrees (°) North by 156 -162° West. Water depths in the survey area range from approximately 1,100 to 5,000 m (0.68 to 3.1 mi).

Comments and Responses

We published a notice of receipt of the Observatory's application and proposed Authorization in the Federal Register on March 30, 2012 (77 FR 19242). During the 30-day public comment period, we received comments from the Marine Mammal Commission (Commission) only. The Commission's comments are online at: <http://www.nmfs.noaa.gov/pr/permits/incidental.htm>. Following are their comments and our responses.

Comment 1: The Commission recommends that, before issuing the requested Authorization, we require the Observatory to: (1) re-estimate the proposed exclusion zones and buffer zones and associated number of marine mammal takes using operational and site-specific environmental parameters; and (2) if the Observatory does not re-estimate the zones, provide a detailed justification for basing the proposed survey's zones on modeling that relies on measurements from the Gulf of Mexico instead of the central Pacific Ocean.

Response: With respect to the Commission's first point, based upon the best available information and our analysis of the likely effects of the specified activity on marine mammals and their habitat, we are satisfied that the Observatory's data are sufficient for us to conduct our analysis and support our determinations under the Marine Mammal Protection Act, the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 et seq.) and the National Environmental Policy Act. The identified zones are appropriate for the survey and additional field measurements are not necessary at this time. Thus, for this survey, we will not require the Observatory to re-estimate the proposed exclusion zones and buffer zones and associated number of marine mammal takes using operational and

site-specific environmental parameters.

With respect to the Commission's second point, The Observatory has modeled the central Pacific Ocean exclusion and buffer zones on modeling based on the 2007-2008 Langseth's peer-reviewed, calibration study in the Gulf of Mexico (Tolstoy, et al, 2004, 2009). The Foundation's Environmental Assessment (see Appendix A) includes detailed information on the study, their modeling process, and a comparison of the Observatory's modeled results with results of the 2007 to 2008 Langseth calibration experiment in shallow, intermediate, and deep water. The conclusions in Appendix A show that the Observatory's model represents the actual produced sound levels, particularly within the first few kilometers, where the predicted zone (i.e., safety radii) lie. At greater distances, local oceanographic variations begin to take effect, and the model tends to over predict.

Because the modeling matches the observed measurement data, the authors concluded that those using the models to predict zones can continue to do so, including predicting exclusion zones around the vessel for various tow depths. At present, the Observatory's model does not account for site-specific environmental conditions and the calibration study analysis of the model predicted that using site-specific information may actually estimate less conservative exclusion zones at greater distances.

While it is difficult to estimate exposures of marine mammals to acoustic stimuli, we are confident that the Observatory's approach to quantifying the exclusion and buffer zones uses the best available scientific information and estimation methodologies.

Comment 2: The Commission recommends that, before issuing the requested Authorization, we use species-specific maximum densities (i.e., estimated by multiplying the existing density estimates by a precautionary correction factor) and then re-estimate

the anticipated number of takes.

Response: For purposes of this Authorization, the Observatory used the cetacean densities based on the National Marine Fisheries Service, Southwest Fisheries Science Center's, eastern tropical Pacific ship transect surveys conducted from 1986 through 2006 (Barlow et al., 2009b; Read et al., 2009) or from surveys conducted in 2002 (Barlow, 2006) to estimate the number of takes. The Observatory's use of these peer-reviewed, model-based, density estimates are the best available information to estimate density for the survey area and to estimate the number of authorized takes for the seismic survey in the central Pacific Ocean. The results of the associated monitoring reports show that our past use of best estimates was appropriate and has not refuted our past determinations.

Comment 3: The Commission recommends that, before issuing the requested IHA, we condition the Authorization to prohibit the use of a 15-minute pause following the sighting of a mysticete or large odontocete in the exclusion zone and to extend the pause to cover the maximum dive times of those species encountered near the vessel prior to initiating ramp-up procedures.

Response: We would like to clarify the Commission's understanding of two conditions within the Authorization—one related to turning on the airguns (ramp-up) after a shutdown due to a marine mammal sighting within the exclusion zone and the other related to a ramp-up after an extended shutdown (i.e., the 15-minute pause due to equipment failure or routine maintenance).

To clarify, the Authorization requires the Langseth to shutdown the airguns when an observer sees a marine mammal within, approaching, or entering the relevant exclusion

zones for cetaceans or for pinnipeds. Following a shutdown, the Langseth would only ramp up the airguns if a marine mammal had exited the relevant exclusion zone or if visual observer had not seen the animal within the relevant exclusion zone for 15 minutes for species with shorter dive times (i.e., small odontocetes and pinnipeds) or 30 minutes for species with longer dive durations (i.e., mysticetes and large odontocetes, including sperm, pygmy sperm, dwarf sperm, killer, and beaked whales).

We believe that 30 minutes is an adequate length for the monitoring period prior to the ramp-up of airguns after sighting a mysticete and large odontocetes for the following reasons:

- The Langseth can transit roughly 4.25 kilometers (km) in 30 minutes. At this distance, the vessel will have moved 60 times ($4.25 \text{ km} \div 0.07 \text{ km}$) away from the distance of the original 180-dB exclusion zone (70 meters (m)) from the initial sighting
- The relevant exclusion zones for cetaceans and pinnipeds are relatively small (i.e., 70 m for cetaceans and 20 m for pinnipeds). Extending the monitoring period for a relatively small exclusion zone would not meaningfully increase the effectiveness of observing marine mammals approaching or entering the exclusion zone for the full source level and would not further minimize the potential for take.
- Because a significant part of their movement is vertical [deep-diving], it is unlikely that a submerged mysticete/large odontocete would move in the same direction and speed (roughly 5 knots) with the vessel for 30 minutes. If an mysticete/large odontocete's maximum underwater dive time is 45 minutes, then

there is only a one in three chance that the last random surfacing could occur within the 70 m exclusion zone.

- The visual observers are constantly monitoring the horizon and the exclusion zones during the 30-minute period. On average, observers can observe to the horizon (10 km; 6.2 miles) from the height of the Langseth's observation deck and should be able to say with a reasonable degree of confidence whether a marine mammal would be encountered within this distance before resuming the two-GI airgun operations at full power.

Next, we intend to clarify the monitoring period associated with an extended shutdown (i.e., the 15-minute pause due to equipment failure or routine maintenance). During active seismic operations, there are occasions when the Langseth's crew will need to temporarily shut down the airguns due to equipment failure or for maintenance. Thus, an extended shutdown is not related to an observer detecting a marine mammal within, approaching, or entering the relevant exclusion zones. However, the observers are still actively monitoring the relevant exclusion zones for cetaceans and pinnipeds.

In the case of an extended shutdown, due to equipment failure or routine maintenance, the Langseth's crew will turn on the airguns and follow the mitigation monitoring procedures for a ramp-up after a period of 15 minutes. Again, the observers will monitor the full exclusion zones for marine mammals and will implement a shutdown if necessary.

In conclusion, we have designed monitoring and mitigation measures to comply with the requirement that incidental take authorizations must include means of effecting the least practicable impact on marine mammal species and their habitat. The effectiveness of monitoring is science-based, and monitoring and mitigation measures must be “practicable.” We believe that the framework for visual monitoring will: (1) be effective at spotting almost all species for which the Observatory has requested take; and (2) that imposing additional requirements, such as those suggested by the Commission, would not meaningfully increase the effectiveness of observing marine mammals approaching or entering the exclusion zones and thus further minimize the potential for take.

Comment 4: The Commission recommends that we work with the Foundation to analyze the data collected during ramp-up procedures to help determine the effectiveness of those procedures as a mitigation measure for geophysical surveys.

Response: We acknowledge the Commission’s request for an analysis of ramp-ups and will work with the Foundation and the Observatory to help identify the effectiveness of the mitigation measure for seismic surveys.

We require the Observatory to gather all data that could potentially provide information regarding the effectiveness of ramp-up as a mitigation measure in its final report. However, considering the low numbers of marine mammal sightings and low number of ramp-ups it is unlikely that the information will result in any statistically robust conclusions for this particular seismic survey. Over the long term, these reporting requirements may provide information regarding the effectiveness of ramp-up as a mitigation measure, provided the observers detect animals during ramp-up.

Description of the Marine Mammals in the Area of the Specified Activity

Twenty-six marine mammal species may occur in the survey area offshore the Line Islands in the central Pacific Ocean, including 19 odontocetes (toothed cetaceans), six mysticetes (baleen whales) and one species of pinniped during May through June, 2012. Six of these species are listed as endangered under the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 et seq.), including the blue (Balaenoptera musculus), fin (Balaenoptera physalus), humpback (Megaptera novaeangliae), sei (Balaenoptera borealis), and sperm (Physeter macrocephalus) whales, and the Hawaiian monk seal (Monachus schauinslandi).

Based on available data, we do not expect the Observatory to encounter nine of the 26 species in the proposed survey areas. They include the: blue, fin, humpback, killer, minke, pygmy, pygmy killer, and sei whales and the Hawaiian monk seal because of the species' rare and/or extralimital occurrence in the survey areas. The Observatory did not request and we did not authorize take of these nine species. Thus, the issued Authorization only addresses requested take authorizations for 17 species: one mysticete, and 16 odontocetes. We expect that delphinids would be the most common marine mammal species in the survey area. They include the pantropical spotted (Stenella attenuata), spinner (S. longirostris) dolphins, and the short-finned pilot whale (Globicephala macrorhynchus).

We have presented a more detailed discussion of the status of these stocks and their occurrence in the central Pacific Ocean in the notice of the proposed Authorization (77 FR 19242, March 30, 2012).

Potential Effects on Marine Mammals

Acoustic stimuli generated by the operation of the airguns, which introduce sound into the marine environment, may have the potential to cause Level B harassment of marine mammals in the survey area. The effects of sounds from airgun operations might include one or more of the following: tolerance, masking of natural sounds, behavioral disturbance, temporary or permanent impairment, or non-auditory physical or physiological effects (Richardson et al., 1995; Gordon et al., 2004; Nowacek et al., 2007; Southall et al., 2007).

Permanent hearing impairment, in the unlikely event that it occurred, would constitute injury, but temporary threshold shift (TTS) is not an injury (Southall et al., 2007). Although one cannot entirely exclude the possibility, it is unlikely that the project would result in any cases of temporary or permanent hearing impairment, or any significant non-auditory physical or physiological effects. Based on the available data and studies described here, we expect some behavioral disturbance to occur, but we expect the disturbance to be localized and short-term.

The notice of the proposed Authorization (77 FR 19242, March 30, 2012) included a discussion of the effects of sounds from airguns on mysticetes and odontocetes including tolerance, masking, behavioral disturbance, hearing impairment, and other non-auditory physical effects. We refer the reader to the Observatory's application and Environmental Assessment for additional information on the behavioral reactions (or lack thereof) by all types of marine mammals to seismic vessels.

Anticipated Effects on Marine Mammal Habitat

We included a detailed discussion of the potential effects of this action on marine mammal habitat, including physiological and behavioral effects on marine fish and invertebrates in the notice of the proposed Authorization (77 FR 19242, March 30, 2012). While we anticipate that the specified activity may result in marine mammals avoiding certain areas due to temporary ensonification, this impact to habitat is temporary and reversible. We considered these impacts in detail in the notice of the proposed Authorization (77 FR 19242, March 30, 2012) as behavioral modification. The main impact associated with the activity would be temporarily elevated noise levels and the associated direct effects on marine mammals.

Mitigation

In order to issue an incidental take authorization under section 101(a)(5)(D) of the Marine Mammal Protection Act, we must set forth the permissible methods of taking pursuant to such activity, and other means of effecting the least practicable adverse impact on such species or stock and its habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and the availability of such species or stock for taking for certain subsistence uses.

The Observatory has based the mitigation measures which they will implement during the seismic survey, on the following:

- (1) Protocols used during previous seismic research cruises as approved by us;
- (2) Previous applications for incidental take authorizations and Authorizations that we have approved and authorized; and

(3) Recommended best practices in Richardson et al. (1995), Pierson et al. (1998), and Weir and Dolman, (2007).

To reduce the potential for disturbance from acoustic stimuli associated with the activities, the Observatory and/or its designees would implement the following mitigation measures for marine mammals:

- (1) Proposed exclusion zones;
- (2) Speed or course alteration;
- (3) Shutdown procedures; and
- (4) Ramp-up procedures.

Exclusion Zones - The Observatory uses safety radii to designate exclusion zones and to estimate take for marine mammals. Table 1 shows the distances at which one would expect to receive three sound levels (160-, 180-, and 190-dB) from the two GI airguns. The 180-dB and 190-dB level shutdown criteria are applicable to cetaceans and pinnipeds, respectively, as specified by us (2000). The Observatory used these levels to establish the exclusion zones.

Table 1. Distances to which sound levels $\geq 160, 180, 190$ dB re: 1 μ Pa (rms) one could receive in deep water during the proposed seismic survey in the central Pacific Ocean, May, 2012. The Observatory provided the Distances are based on their model results.

Source and Volume	Tow Depth (m)	Water Depth (m)	Predicted RMS Radii Distances (m)		
			160 dB	180 dB	190 dB
Two GI airguns (105 in ³)	3	Deep (> 1,000)	670	70	20

If the visual observer detects marine mammal(s) within or about to enter the appropriate exclusion zone, the Langseth crew would shut down the airguns immediately.

Speed or Course Alteration - If the visual observer detects a marine mammal outside the zone and, based on its position and the relative motion, the marine mammal is likely to enter the zone, the Langseth could change the vessel's speed and/or direct course. The Langseth would implement speed or course operation if operationally practicable, thus minimizing the effect on the planned science objectives. The visual observer would monitor the activities and movements of the marine mammal (relative to the seismic vessel) to determine if the animal is approaching the applicable exclusion zone. If the animal appears likely to enter the zone, the Langseth would implement further mitigation measures, (i.e., either further course alterations or a shut-down of the seismic source). Typically, during seismic operations, the source vessel is unable to change speed or course and the Langseth would need to implement one or more alternative mitigation measures.

Shut-down Procedures – The Langseth will shut down the operating airgun(s) if a marine mammal is seen outside the exclusion zone for the airgun(s). If the vessel cannot change its speed and/or course to avoid having the animal enter the zone, the Langseth will shutdown the seismic source before the animal is within the zone. If a marine mammal is already within the zone when first detected, the Langseth will shutdown the seismic source immediately.

Following a shut-down, the Langseth will not resume airgun activity until the marine mammal has cleared the zone. The visual observer will consider the animal to have cleared the zone if:

- A visual observer has visually observed the animal leave the zone, or

- A visual observer has not sighted the animal within the zone for 15 minutes for species with shorter dive durations (i.e., small odontocetes or pinnipeds), or 30 minutes for species with longer dive durations (i.e., mysticetes and large odontocetes, including sperm, killer, and beaked whales).

Ramp-up Procedures – The Observatory will follow a ramp-up procedure when the airgun array begins operating after a specified period without airgun operations or when a shut-down has exceeded that period. The Observatory proposes that, for the present cruise, this period would be approximately 15 minutes. The Observatory has used similar periods (approximately 15 minutes) during previous seismic surveys.

The Observatory will begin a ramp-up with a single GI airgun (105 in³) and will add the second GI airgun (105 in³) after five minutes. During ramp-up, the visual observer will monitor the exclusion zone, and if he/she sights a marine mammal(s), the Langseth will implement a shut-down as though both GI airguns were operational.

If the complete zone is not visible for at least 30 minutes prior to the start of operations in either daylight or nighttime, the Langseth will not commence the ramp-up. If one airgun is operational, ramp-up to full power will be permissible at night or in poor visibility, on the assumption that marine mammals will be alerted to the approaching seismic vessel by the sounds from the single airgun and could move away if they choose. A ramp-up from a shut-down may occur at night, but only where the exclusion zone is small enough to be visible. The Observatory will not initiate a ramp-up of the airguns if a visual observer detects a marine mammal within or near the applicable zones during the day or close to the vessel at night.

We have carefully evaluated the proposed mitigation measures and have considered a range of other measures in the context of ensuring that we prescribe the means of effecting the least practicable adverse impact on the affected marine mammal species and stocks and their habitat. Our evaluation of potential measures included consideration of the following factors in relation to one another:

- (1) The manner in which, and the degree to which, the successful implementation of the measure is expected to minimize adverse impacts to marine mammals;
- (2) The proven or likely efficacy of the specific measure to minimize adverse impacts as planned; and
- (3) The practicability of the measure for applicant implementation.

Based on our evaluation of the proposed measures, as well as other measures considered by us or recommended by the public for previous low-energy seismic surveys, we have determined that the mitigation measures provide the means of effecting the least practicable adverse impacts on marine mammal species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance.

Monitoring and Reporting

In order to issue an incidental take authorization for an activity, section 101(a)(5)(D) of the Marine Mammal Protection Act states that we must set forth “requirements pertaining to the monitoring and reporting of such taking.” The Act’s implementing regulations at 50 CFR 216.104 (a)(13) indicate that requests for an authorization must include the suggested means of accomplishing the necessary monitoring and reporting that will result in increased knowledge of the species and our expectations of the level of taking or impacts on populations of marine mammals present in the action area.

Monitoring

The Observatory will conduct marine mammal monitoring during the present project, in order to implement the mitigation measures that require real-time monitoring, and to satisfy the monitoring requirements of the issued Authorization. We describe the Observatory's Monitoring Plan below this section. The Observatory has planned the monitoring work as a self-contained project independent of any other related monitoring projects that may be occurring simultaneously in the same regions. Further, the Observatory is prepared to discuss coordination of its monitoring program with any related work that might be done by other groups insofar as this is practical and desirable.

Vessel-based Visual Monitoring

The Observatory will position visual observers aboard the seismic source vessel to watch for marine mammals near the vessel during daytime airgun operations and during any ramp-ups at night. The observers will also watch for marine mammals near the seismic vessel for at least 30 minutes prior to the ramp-up of airgun operations after an extended shut-down (i.e., greater than approximately 15 minutes for this proposed cruise). When feasible, the observers will conduct observations during daytime periods when the seismic system is not operating for comparison of sighting rates and behavior with and without airgun operations and between acquisition periods. Based on their observations, the Langseth will shutdown the airguns when they detect marine mammals within or about to enter a designated exclusion zone. The zone is a region in which a possibility exists of adverse effects on animal hearing or other physical effects.

During seismic operations in the central Pacific Ocean, at least three visual observers will be aboard the Langseth. The Observatory will appoint the observers with our

concurrence. At least one observer will monitor the zones during seismic operations. Observations will take place during ongoing daytime operations and nighttime ramp-ups of the airguns. Observers will be on duty in shifts of duration no longer than four hours. The vessel crew will also be instructed to assist in detecting marine mammals.

The Langseth is a suitable platform for marine mammal observations. When stationed on the observation platform, the eye level will be approximately 21.5 m (70.5 ft) above sea level, and the observer will have a good view around the entire vessel. During daytime, the visual observers will scan the area around the vessel systematically with reticle binoculars (e.g., 7 x 50 Fujinon), big-eye binoculars (25 x 150), and with the naked eye. During darkness, night vision devices (NVDs) will be available (ITT F500 Series Generation 3 binocular-image intensifier or equivalent), when required. Laser range-finding binoculars (Leica LRF 1200 laser rangefinder or equivalent) will be available to assist with distance estimation. Those are useful in training observers to estimate distances visually, but are generally not useful in measuring distances to animals directly; that is done primarily with the reticles in the binoculars.

When the visual observers detect marine mammals within or about to enter the designated exclusion zone, the Langseth will immediately shut-down the airguns if necessary. The observers will continue to maintain watch to determine when the animal(s) are outside the zone by visual confirmation. The Langseth will not resume airgun operations until he/she confirms that the animal has left the zone, or if the observer has not observed the animal after 15 minutes for species with shorter dive durations (small odontocetes and pinnipeds) or 30 minutes for species with longer dive durations (mysticetes and large odontocetes, including sperm, killer, and beaked whales).

Observer Data and Documentation

The observers will record data to estimate the numbers of marine mammals exposed to various received sound levels and to document apparent disturbance reactions or lack thereof. The Observatory will use the data to estimate numbers of animals potentially ‘taken’ by harassment (as defined in the Marine Mammal Protection Act). The data will also provide information needed to order a shutdown of the airguns when a marine mammal is within or near the exclusion zone. Also, the observers will also be on watch during daytime periods when the Langseth is underway without seismic operations (i.e., transits to, from, and through the study area) to collect baseline biological data.

When an observer makes a sighting, they will record the following information: :

1. Species, group size, age/size/sex categories (if determinable), behavior when first sighted and after initial sighting, heading (if consistent), bearing and distance from seismic vessel, sighting cue, apparent reaction to the airguns or vessel (e.g., none, avoidance, approach, paralleling, etc.), and behavioral pace.
2. Time, location, heading, speed, activity of the vessel, sea state, visibility, and sun glare.

The observer will record the data listed under (2) at the start and end of each observation watch, and during a watch whenever there is a change in one or more of the variables.

Observers will record all observations in a standardized format and will enter data into an electronic database. The observers will verify the accuracy of the data entry by computerized data validity checks as the data are entered and by subsequent manual checking of the database. These procedures will allow the preparation of initial

summaries of data during and shortly after the field program, and will facilitate transfer of the data to statistical, graphical, and other programs for further processing and archiving.

Results from the vessel-based observations will provide:

1. The basis for real-time mitigation (airgun power down or shutdown).
2. Information needed to estimate the number of marine mammals potentially taken by harassment, which the Observatory must report to the Office of Protected Resources.
3. Data on the occurrence, distribution, and activities of marine mammals and turtles in the area where the Observatory will conduct the seismic study.
4. Information to compare the distance and distribution of marine mammals and turtles relative to the source vessel at times with and without seismic activity.
5. Data on the behavior and movement patterns of marine mammals detected during non-active and active seismic operations.

Reporting

The Observatory will submit a report to us and to the Foundation within 90 days after the end of the cruise. The report will describe the operations that were conducted and sightings of marine mammals and turtles near the operations. The report will provide full documentation of methods, results, and interpretation pertaining to all monitoring. The 90-day report will summarize the dates and locations of seismic operations, and all marine mammal sightings (dates, times, locations, activities, associated seismic survey activities). The report will also include estimates of the number and nature of exposures that could result in “takes” of marine mammals by harassment or in other ways.

In the unanticipated event that the specified activity clearly causes the take of a

marine mammal in a manner prohibited by the issued Authorization, such as an injury (Level A harassment), serious injury or mortality (e.g., ship-strike, gear interaction, and/or entanglement), the Observatory shall immediately cease the specified activities and immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401 and/or by email to Jolie.Harrison@noaa.gov and ITP.Cody@noaa.gov and the Pacific Islands Regional Stranding Coordinator at 808-944-2269 (David.Schofield@noaa.gov). The report must include the following information:

- Time, date, and location (latitude/longitude) of the incident;
- Name and type of vessel involved;
- Vessel's speed during and leading up to the incident;
- Description of the incident;
- Status of all sound source use in the 24 hours preceding the incident;
- Water depth;
- Environmental conditions (e.g., wind speed and direction, Beaufort sea state, cloud cover, and visibility);
- Description of all marine mammal observations in the 24 hours preceding the incident;
- Species identification or description of the animal(s) involved;
- Fate of the animal(s); and
- Photographs or video footage of the animal(s) (if equipment is available).

The Observatory shall not resume its activities until we are able to review the circumstances of the prohibited take. We shall work with the Observatory to determine

what is necessary to minimize the likelihood of further prohibited take and ensure Marine Mammal Protection Act compliance. The Observatory may not resume their activities until notified by us via letter, email, or telephone.

In the event that the Observatory discovers an injured or dead marine mammal, and the lead visual observer determines that the cause of the injury or death is unknown and the death is relatively recent (i.e., in less than a moderate state of decomposition as we describe in the next paragraph), the Observatory will immediately report the incident to the Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401 and/or by email to Jolie.Harrison@noaa.gov and ITP.Cody@noaa.gov and the Pacific Islands Regional Stranding Coordinator at 808-944-2269 (David.Schofield@noaa.gov). The report must include the same information identified in the paragraph above this section. Activities may continue while we review the circumstances of the incident. We will work with the Observatory to determine whether modifications in the activities are appropriate.

In the event that the Observatory discovers an injured or dead marine mammal, and the lead visual observer determines that the injury or death is not associated with or related to the authorized activities (e.g., previously wounded animal, carcass with moderate to advanced decomposition, or scavenger damage), the Observatory will report to the Acting Chief of the Permits and Conservation Division, Office of Protected Resources, NMFS, at 301-427-8401 and/or by email to Jolie.Harrison@noaa.gov and ITP.Cody@noaa.gov and the NMFS Pacific Islands Regional Stranding Coordinator at 808-944-2269 (David.Schofield@noaa.gov), within 24 hours of the discovery. The Observatory will provide photographs or video footage (if available) or other

documentation of the stranded animal sighting to us.

Estimated Take by Incidental Harassment

Except with respect to certain activities not pertinent here, the Marine Mammal Protection Act defines "harassment" as: any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild [Level A harassment]; or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering [Level B harassment].

We have authorized incidental take by Level B harassment only for the marine geophysical survey in the central Pacific Ocean. Acoustic stimuli (i.e., increased underwater sound) generated during the operation of the seismic airgun array may have the potential to cause marine mammals in the survey area to be exposed to sounds at or greater than 160 dB re: 1 μ Pa or cause temporary, short-term changes in behavior. There is no evidence that the Observatory's planned activities could result in injury, serious injury or mortality within the specified geographic area for the Authorization. The required mitigation and monitoring measures will minimize any potential risk for injury, serious injury, or mortality.

The Observatory's estimates assume that marine mammals exposed to airgun sounds greater than or equal to 160 dB re: 1 μ Pa might change their behavior sufficiently for us to consider them as taken by harassment. They have based their estimates on the number of marine mammals that could be disturbed appreciably by operations with the two GI airgun array during approximately 2,316 square km (894 square miles) (includes primary

and secondary lines and an additional 25 percent contingency) of survey lines in the central Pacific Ocean.

We assume that during simultaneous operations of the airgun array and the other sources, any marine mammals close enough to be affected by the echosounder, sub-bottom profiler, and acoustic Doppler current profiler would already be affected by the airguns. However, whether or not the airguns are operating simultaneously with the other sources, we expect that the marine mammals would exhibit no more than short-term and inconsequential responses to the echosounder and profiler given their characteristics (e.g., narrow downward-directed beam) and other considerations described previously. Based on the best available information, we do not consider that these reactions constitute a “take” (NMFS, 2001). Therefore, the Observatory did not provide any additional allowance for animals that could be affected by sound sources other than the two airguns.

We have presented a more detailed discussion of the Observatory’s methods to estimate take by incidental harassment in the notice of the proposed Authorization (77 FR 19242, March 30, 2012). Refer to the notice for more detailed information on the density data and their methodology to estimate take.

The Observatory’s estimates of exposures to various sound levels assume that they will complete the surveys; in fact, they have increased the calculations of the ensonified by 25 percent to accommodate turns, lines that may need to be repeated, and equipment testing. As is typical during ship surveys, inclement weather and equipment malfunctions may cause delays and may limit the number of useful line-kilometers of seismic operations that the Observatory can finish. Furthermore, any marine mammal sightings within or near the designated exclusion zone will result in the shutdown of seismic

operations as a mitigation measure. Thus, the following estimates of the numbers of marine mammals potentially exposed to 160-dB re:1 μ Pa sounds are precautionary, and probably overestimate the actual numbers of marine mammals that might be involved. These estimates assume that there will be no weather, equipment, or mitigation delays, which is highly unlikely.

Table 2 in this notice shows estimates of the number of individual cetaceans that potentially could be exposed to greater than or equal to 160 dB re: 1 μ Pa during the seismic survey if no animals moved away from the survey vessel. We present the take authorization in the far right column of Table 3. For endangered species, the requested take authorization reflects the mean group size in the eastern tropical Pacific Ocean (Jackson et al., 2008) for the particular species in cases where the calculated number of individuals exposed was between 0.05 and the mean group size (i.e., for the sperm whale). For non-listed species, the requested take authorization reflects the mean group size in the Center's survey area (Barlow et al., 2008) for the particular species in cases where the calculated number of individuals exposed was between one and the mean group size.

The total estimate of the number of individual cetaceans that could be exposed to seismic sounds with received levels greater than or equal to 160 dB re: 1 μ Pa during the proposed survey is 828 (see Table 2 in this notice). That total includes: four Bryde's whales or 0.01 percent of the regional population; and seven sperm whales (also listed as endangered) or 0.03 percent of the regional population could be exposed during the survey.

As stated earlier in this notice, the Observatory did not estimate take of endangered humpback, sei, blue, or fin whales or Hawaiian monk seals because of the low likelihood of encountering these species during the cruise. In addition, 18 beaked whales (16 Cuvier's, one Longman's, and one Mesoplodon spp.) could be exposed during the survey. Most (94.7 percent) of the cetaceans that could be potentially exposed are delphinids (e.g., spinner, pantropical spotted, and striped dolphins are estimated to be the most common species in the area) with maximum estimates ranging from four to 425 species exposed to levels greater than or equal to 160 dB re: 1 μ Pa.

Table 3. Estimates of the possible numbers of marine mammals exposed to different sound levels during the Observatory's seismic survey in the central Pacific Ocean during May, 2012.

Species	Estimated Number of Individuals Exposed to Sound Levels ≥ 160 dB re: 1 μ Pa ¹	Approximate Percent of Regional Population ²	Requested Take Authorization
Bryde's whale	1	0.01	4 ⁴
Blue whale	0	< 0.01	0
Sperm whale	7	0.03	8 ⁴
Dwarf sperm whale	18	0.16	18
Cuvier's beaked whale	16	0.08	16
Longman's beaked whale	1	0.36	14 ⁴
<u>Mesoplodon</u> spp. ³	1	<0.01	4 ⁴
Rough-toothed dolphin	3	<0.01	13 ⁴
Bottlenose dolphin	11	<0.01	12 ⁴
Pantropical spotted dolphin	279	0.06	279
Spinner dolphin	425	0.02	425
Striped dolphin	38	<0.01	46 ⁴
Fraser's dolphin	11	<0.01	182 ⁴
Risso's dolphin	2	<0.01	14 ⁴
Melon-headed whale	3	0.01	101 ⁴
False killer whale	0	<0.01	9 ⁴
Short-finned pilot whale	12	<0.01	24 ⁴

¹ Estimates are based on densities from Table 3 in the notice of the proposed Authorization (77 FR 19242, March 30, 2012) and an ensounded area (including 25 percent contingency).

² Regional population size estimates are from Table 2 notice of the proposed Authorization (77 FR 19242, March 30, 2012).

³ Includes ginkgo-toothed and/or Blainville's beaked whales.

⁴ Requested take authorization increased to mean group size.

Encouraging and Coordinating Research

The Observatory and the Foundation will coordinate the planned marine mammal monitoring program associated with each seismic survey in the central Pacific Ocean with other parties that may have interest in the area and/or may be conducting marine mammal studies in the same region during the seismic surveys.

Negligible Impact and Small Numbers Analysis and Determination

We have defined “negligible impact” in 50 CFR 216.103 as “...an impact resulting from the specified activity that cannot be reasonably expected to, and is not reasonably likely to, adversely affect the species or stock through effects on annual rates of recruitment or survival.” In making a negligible impact determination, we consider:

- (1) The number of anticipated injuries, serious injuries, or mortalities;
- (2) The number, nature, and intensity, and duration of Level B harassment (all relatively limited); and
- (3) The context in which the takes occur (i.e., impacts to areas of significance, impacts to local populations, and cumulative impacts when taking into account successive/contemporaneous actions when added to baseline data);
- (4) The status of stock or species of marine mammals (i.e., depleted, not depleted, decreasing, increasing, stable, impact relative to the size of the population);
- (5) Impacts on habitat affecting rates of recruitment/survival; and
- (6) The effectiveness of monitoring and mitigation measures.

For reasons stated previously in this document, the specified activities associated with the marine seismic surveys are not likely to cause permanent threshold shift, or other non-auditory injury, serious injury, or death because:

(1) The likelihood that, given sufficient notice through relatively slow ship speed, we expect marine mammals to move away from a noise source that is annoying prior to its becoming potentially injurious;

(2) The potential for temporary or permanent hearing impairment is relatively low and that we would likely avoid this impact through the incorporation of the required monitoring and mitigation measures (described previously in this document);

(3) The fact that cetaceans would have to be closer than 70 meters (229.7 feet) in deep water when the two GI airgun array has a 3-meter (9.8 feet) tow depth from the vessel to be exposed to levels of sound believed to have even a minimal chance of causing permanent threshold shift; and

(4) The likelihood that marine mammal detection ability by trained marine mammal observers is high at close proximity to the vessel.

We do not anticipate that any injuries, serious injuries, or mortalities would occur as a result of the Observatory's planned marine seismic surveys, and we do not propose to authorize injury, serious injury or mortality for this survey. We anticipate only short-term behavioral disturbance to occur during the conduct of the survey activities. Table 2 of this document outlines the number of requested Level B harassment takes that we anticipate as a result of these activities. Due to the nature, degree, and context of Level B (behavioral) harassment anticipated and described (see "Potential Effects on Marine Mammals" section in this notice), we do not expect the activity to impact rates of recruitment or survival for any affected species or stock. Further, the seismic surveys would not take place in areas of significance for marine mammal feeding, resting, breeding, or calving and would not adversely impact marine mammal habitat.

Many animals perform vital functions, such as feeding, resting, traveling, and socializing, on a diel cycle (i.e., 24 hour cycle). Behavioral reactions to noise exposure (such as disruption of critical life functions, displacement, or avoidance of important habitat) are more likely to be significant if they last more than one diel cycle or recur on subsequent days (Southall et al., 2007). While we anticipate that the seismic operations would occur on consecutive days, the estimated duration of the survey would last no more than 6 days and the Langseth will be continuously moving along planned tracklines. Therefore, the seismic survey will be increasing sound levels in the marine environment in a relatively small area surrounding the vessel, which is constantly traveling over far distances, for a relatively short time period in the study area.

Of the 26 marine mammal species under our (the National Marine Fisheries Service's) jurisdiction that are known to occur or may occur in the study area, six are listed as endangered under the Endangered Species Act: the humpback, sei, fin, blue, and sperm whale and the Hawaiian monk seal. We also consider these species as depleted under the Marine Mammal Protection Act.

Based on available data, we do not expect the Observatory to encounter nine of the 26 species in the proposed survey areas. They include the: blue, fin, humpback, killer, minke, pygmy, pygmy killer, and sei whales and the Hawaiian monk seal because of the species' rare and/or extralimital occurrence in the survey areas and the low likelihood of encountering these species during the cruise. The Observatory did not request and we did not authorize take of these nine species. Thus, the issued Authorization only addresses requested take authorizations for 17 species: one mysticete, and 16 odontocetes. As mentioned previously, the survey would not occur in any areas designated as critical

habitat for Endangered Species Act-listed species and would not adversely impact marine mammal habitat. To protect these animals (and other marine mammals in the study area), the Observatory must cease or reduce airgun operations if animals enter designated zones.

As mentioned previously, we estimate that 17 species of marine mammals under our jurisdiction could be potentially affected by Level B harassment over the course of the proposed IHA. For each species, these numbers are small (each less than one percent) relative to the regional population size (see Table 2).

Our practice has been to apply the 160 dB re: 1 μ Pa received level threshold for underwater impulse sound levels to determine whether take by Level B harassment occurs. Southall et al. (2007) provides a severity scale for ranking observed behavioral responses of both free-ranging marine mammals and laboratory subjects to various types of anthropogenic sound (see Table 4 in Southall et al. [2007]).

We have determined, provided that the aforementioned mitigation and monitoring measures are implemented, that the impact of conducting a marine seismic survey in the central Pacific Ocean, May through June, 2012, may result, at worst, in a temporary modification in behavior and/or low-level physiological effects (Level B harassment) of small numbers of certain species of marine mammals.

While these species may make behavioral modifications, including temporarily vacating the area during the operation of the airgun(s) to avoid the resultant acoustic disturbance, the availability of alternate areas within these areas and the short duration of the research activities, have led us to determine that this action will have a negligible impact on the species in the specified geographic region.

Based on the analysis contained herein of the likely effects of the specified activity on marine mammals and their habitat, and taking into consideration the implementation of the mitigation and monitoring measures, we have found that the Observatory's planned research activities would result in the incidental take of small numbers of marine mammals, by Level B harassment only, and that the total taking from the marine seismic survey would have a negligible impact on the affected species or stocks of marine mammals; and that the required measures mitigate impacts to affected species or stocks of marine mammals to the lowest level practicable.

Impact on Availability of Affected Species or Stock for Taking for Subsistence Uses

Section 101(a)(5)(D) of the Marine Mammal Protection Act also requires us to determine that the authorization will not have an unmitigable adverse effect on the availability of marine mammal species or stocks for subsistence use. There are no relevant subsistence uses of marine mammals in the study area (central Pacific Ocean) that implicate section 101(a)(5)(D) of the Act.

Endangered Species Act

Of the species of marine mammals that may occur in the proposed survey area, several are listed as endangered under the ESA, including the blue, fin, humpback, sei, and sperm whale and Hawaiian monk seal. The Observatory did not request take of endangered humpback, sei, blue, or fin whales or Hawaiian monk seals because of the low likelihood of encountering these species during the cruise. As mentioned previously, the survey would not occur in any areas designated as critical habitat for listed species and would not adversely impact marine mammal habitat.

Under section 7 of this Act, the Foundation initiated formal consultation with the

National Marine Fisheries Service, Office of Protected Resources, Endangered Species Act Interagency Cooperation Division, on this seismic survey. We, (the Permits and Conservation Division), also initiated formal consultation under section 7 of the Act with the Endangered Species Act Interagency Cooperation Division, to obtain a Biological Opinion (Opinion) evaluating the effects of issuing an incidental harassment authorization for threatened and endangered marine mammals and, if appropriate, authorizing incidental take. In May 2012, the Endangered Species Act Interagency Cooperation Division issued an Opinion and concluded that the action and issuance of the Authorization was not likely to jeopardize the continued existence of blue, fin, humpback, sei, and sperm whales and Hawaiian monk seals. The Opinion also concluded that the survey would not affect designated critical habitat for these species. The Foundation and the Observatory must comply with the Relevant Terms and Conditions of the Incidental Take Statement corresponding to the Opinion issued to us, the Foundation, and the Observatory. The Observatory must also comply with the Authorization's mitigation and monitoring requirements in order to be exempt under the Incidental Take Statement in the Opinion from the prohibition on take of listed endangered marine mammal species otherwise prohibited by section 9 of the Act.

National Environmental Policy Act (NEPA)

With its complete application, the Foundation and the Observatory provided an “Environmental Assessment and Finding of No Significant Impact Determination Pursuant to the National Environmental Policy Act, (NEPA: 42 U.S.C. 4321 et seq.) and Executive Order 12114 for a “Marine Geophysical Survey by the R/V Marcus G. Langseth in the Central Pacific Ocean May, 2012,” which incorporates an

“Environmental Assessment of a Marine Geophysical Survey by the R/V Marcus G. Langseth in the central Pacific Ocean, May, 2012,” prepared by LGL Limited environmental research associates on behalf of the Foundation and the Observatory.

The Assessment analyzed the direct, indirect, and cumulative environmental impacts of the specified activities on marine mammals including those listed as threatened or endangered under the Endangered Species Act. We conducted an independent review and evaluation of the document for sufficiency and compliance with the Council of Environmental Quality and NOAA Administrative Order 216–6 § 5.09(d), Environmental Review Procedures for Implementing the National Environmental Policy Act, and determined that issuance of the Authorization is not likely to result in significant impacts on the human environment. Also, we have provided relevant environmental information to the public through the notice of the proposed Authorization (77 FR 19242, March 30, 2012) and have considered public comments received in response prior to adopting the Foundation’s Assessment. We have concluded that issuance of an Authorization would not significantly affect the quality of the human environment and have issued a separate Finding of No Significant Impact. Because we have made this finding, it is not necessary to prepare an environmental impact statement for the issuance of an Authorization to the Observatory for this activity.

Authorization

As a result of these determinations, we have issued an Incidental Harassment Authorization to the Observatory for the take of small numbers of marine mammals, by Level B harassment incidental to conducting a marine geophysical survey in the central Pacific Ocean, May 1 through June 11, 2012, provided the Observatory implements the previously mentioned mitigation, monitoring, and reporting requirements. The Authorization's duration will not exceed one year from the date of issuance.

Dated: April 30, 2012

Helen M. Golde,
Acting Director, Office of Protected Resources,
National Marine Fisheries Service.

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